

DATE: January 25, 2000

Sent out 2/1/00

TO: Region Engineers
Region Associate Delivery Engineers
Region Construction Engineers
Resident/Project Engineers/TSC Managers
Region Traffic Engineers

FROM: C. Thomas Maki
Chief Operations Officer

Gary D. Taylor
Chief Engineer/Deputy Director
Bureau of Highway Technical Services

SUBJECT: Bureau of Highway Instructional Memorandum 2000-01
Improving Safety of Night Work

In an effort to make active nighttime construction zones safer for both the motorist and workers, CONSIDER incorporating the items listed below in projects where night work is performed.

1. If possible, do not implement a traffic stage change after dark. If unavoidable, police presence to assist in traffic control should be considered. Examples of stage changes are the time during work zone set up or tear down, and switching from one stage to another.
2. If plastic drums are used, place at 16 m maximum spacing distance in the vicinity of the active work.
3. When workers are present at night, place a portable changeable message board (PCMB) or static sign with the message "Active Night Work Ahead." Use a PCMB if one is already available on the project. If not, use a diamond shaped sign blank, 1200mm x 1200mm, with black on orange sheeting. The sheeting should be the same as specified for other warning signs on the project. The wording "Active Night Work Ahead" should be laid out similarly to a W20-5a sign with four lines of legend and 100mm C series letters.

Placement of the sign should be after the "Road Work Ahead" (W21-4) sign.

The sign or message is to be displayed **only** when workers are present at night. Cover or remove the sign when workers are not present at night.

4. If the police are actively involved in enforcement activities in the work zone, a portable changeable message board displaying a message such as, "Speed Enforcement Zone", will enhance their effectiveness.
5. Mount modified high intensity lights, Type B, on each of the four lead-in sets of diamond shaped warning signs, including the "Active Night Work Ahead" sign as described above. The light's visibility is the same as a high intensity light, Type B. It is mountable to a sign like a Type A and is equipped with a photocell. The Special Provision for High Intensity Light, Type B, Modified (Attachment A) is attached. These lights should be turned off whenever active night work is not occurring.
6. When workers are present at night, place one sign trailer with flashers in advance of the active night work as described in the attached Special Provision for Sign Trailer with Solar-Assisted Flashers (Attachment B).
7. On projects where traffic control is paid for as a lump sum, these additional measures should be included in the lump sum item. A version of the special provisions is available for lump sum projects (Attachments C and D).

The seven items listed above should be CONSIDERED on projects where night work is to be performed. These measures were developed with industry as practical steps that could be implemented to improve safety in active nighttime work zones.

Questions should be directed to Jeff Grossklaus, Construction and Technology Division, at 517-335-2242.

Maki	Gary D. Taylor, Chief Engineer/Deputy Director	C. Thomas
Chief Operations Officer	Bureau of Highway Technical Services	

BOHTS:C/T:PAL:JG:kab

Subject Index: Safety

Attachments

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MICHIGAN
DEPARTMENT OF TRANSPORTATION

Attachment A

SPECIAL PROVISION
FOR
HIGH INTENSITY LIGHT, TYPE B, MODIFIED

C&T:DJR

1 of 1

09-14-99

C&T:APPR:JAR:JKG 09-20-99

a. Description.-Use the High Intensity Light, Type B-Modified in **all night work operations where workers are present**. Place the light on the first four sets of lead-in diamond shaped warning signs, including the sign "Active Night Work Ahead". Mount the light on the top quadrant of the sign nearest traffic.

b. Materials.-The High Intensity Light, Type B-Modified will conform to the Michigan Manual of Uniform Traffic Control Devices, Revised 1994 Edition, March 1998, Section 6F-E, and will also have: a photocell that turns the light off when ambient light exceeds 54 Lux and turns the light on when ambient light falls below 54 Lux; an automatic intensity control that maintains brightness at near 100 percent for all conditions above power failure; and an attachment mechanism similar to the one used for Type A lights on signs.

c. Measurement and Payment.-Measurement and payment is according to the following pay items.

Contract Item (Pay Item)	Pay Unit
High Intensity Light, Type B, Furnished-Modified	each
High Intensity Light, Type B, Operated-Modified	each

The unit price for **High Intensity Light, Type B, Furnished-Modified** is payment for furnishing and installing the light, including the necessary installation hardware; and payment for replacing a light damaged by vehicular traffic other than the Contractor's vehicles or equipment.

The unit price for **High Intensity Light, Type B, Operated-Modified** is payment for operating, inspecting, maintaining, relocating and removing the item from the project.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

Attachment B

SPECIAL PROVISION
FOR
SIGN TRAILER WITH SOLAR-ASSISTED FLASHERS

T&S:MWB

REVISED: 07-21-99
C&T:APPR:JKG:MLL 03-26-98

a. Description.-This special provision describes a trailer-mounted sign support with flashers, displaying a static sign and four solar-assisted LED lamps that can be turned on in an alternating flash mode, to alert the motorists of a speed reduction in the presence of workers.

b. Materials.-The materials shall meet the following minimum requirements:

1. The battery storage capacity shall operate the flashing lights for a minimum period of 20 days without sun at temperatures 4 °C and above.
2. The flashing lights, amber, two each on either side of the sign panel, shall be LED type with a flash rate of 55 to 75 flashes per minute. There shall be an on-off switch for the lights.
3. The LED lamps shall be visible from 0.8 km.
4. The charger controller shall incorporate low voltage disconnect to protect the battery from complete discharge and a regulator to eliminate overcharging of the battery.
5. The charger controller shall be equipped with a photocell for 50 percent dimming for night use.
6. The sign panel stand shall accommodate 1200 mm wide warning/regulatory signs, with a minimum total panel height of 2500 mm, as shown in the typical plan A-901. The bottom height of the sign panel stand shall be not less than 800 mm.
7. A single, 175 mm diameter, flashing, amber, indicator light shall be installed on the back side of the sign panel to indicate, to the workers, that the sign trailer flashers are operational. This lamp shall be visible from a distance of 150 m.
8. The reflective sheeting for the required static signs shall be paid for by the contract items for either Sign, Type B, Temporary, Prismatic Retroreflective or Sign, Type B, Temporary as designated.

9. The trailer shall be delineated with 50mm wide strips of reflectorized red and white conspicuity tape as per the Special Provision For Reflective Conspicuity For Vehicles And Equipment In Work Zones, FUSP104(D).

c. General Requirements.-When a lane closure, greater than or equal to 1.6 km in length, is implemented, the Sign Trailer with Solar Assisted Flashers shall be placed, within the tangent section of the lane closure, behind the channelizing devices. The trailer should be placed a minimum distance of 260 m in advance of the workers.

When lane closures less than 1.6 km in length are implemented, the Sign Trailer with Solar Assisted Flashers shall be placed 152 m in advance of the shift or taper on the shoulder.

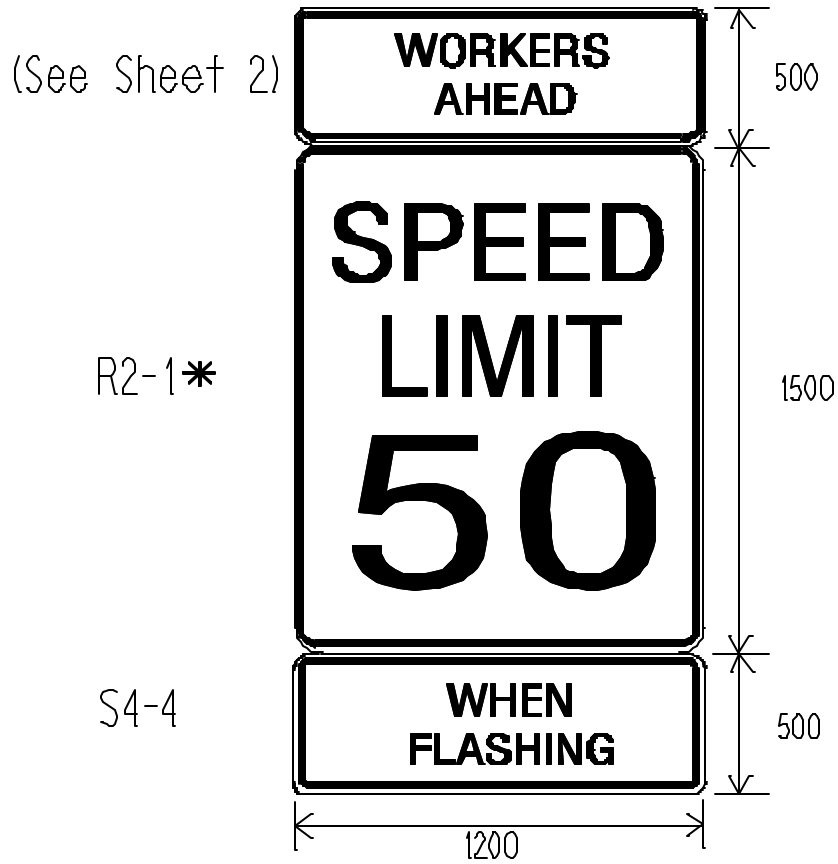
When other configurations exist, than those described above, or if the tangent section of the lane closure, behind the channelizing devices is narrow, or none exists, the placement of the Sign Trailer with Solar Assisted Flashers shall be adjusted as outlined in the Special Provision for Maintaining Traffic.

When workers are not present, the Sign Trailer with Solar Assisted Flashers shall be turned off and relocated to a location beyond the clear zone unless the trailer has been placed behind guardrail or concrete barrier. The warning/regulatory signs on the trailer should be turned down, covered, or turned away from the approaching traffic.

d. Measurement and Payment.-The completed work as measured for **Sign Trailer with Solar-Assisted Flashers** will be paid for at the contract unit price for the following contract items:

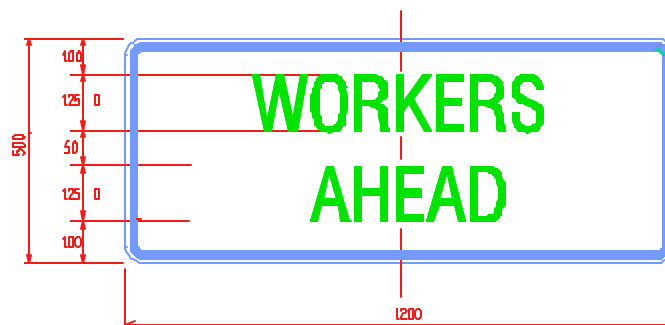
Contract Item (Pay Item)	Pay Unit
Sign Trailer with Solar-Assisted Flashers-Furnished	each
Sign Trailer with Solar-Assisted Flashers-Operated	each

The pay unitprice for **Sign Trailer with Solar-Assisted Flashers-Operated** shall include operating, inspecting, maintaining, cleaning, protecting, relocating, and removing the item from the project.



* SPEED LIMIT SHALL BE AS INDICATED IN THE SPECIAL PROVISION FOR MAINTAINING TRAFFIC.

A-901



MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
**HIGH INTENSITY LIGHT, TYPE B, MODIFIED
(TRAFFIC CONTROL, LUMP SUM)**

C&T:DJR

1 of 1

01-20-00

C&T:APPR:JAR:JKG 01-20-00

a. Description.-Use the High Intensity Light, Type B-Modified in **all night work operations where workers are present**. Place the light on the first four sets of lead-in diamond shaped warning signs, including the sign "Active Night Work Ahead". Mount the light on the top quadrant of the sign nearest traffic.

This work includes furnishing and installing the light, including the necessary installation hardware; replacing a light damaged by vehicular traffic other than the Contractor's vehicles or equipment; and operating, inspecting, maintaining, relocating and removing the light(s).

b. Materials.-The High Intensity Light, Type B-Modified will conform to the Michigan Manual of Uniform Traffic Control Devices, Revised 1994 Edition, March 1998, Section 6F-E, and will also have: a photocell that turns the light off when ambient light exceeds 54 Lux and turns the light on when ambient light falls below 54 Lux; an automatic intensity control that maintains brightness at near 100 percent for all conditions above power failure; and an attachment mechanism similar to the one used for Type A lights on signs.

c. Measurement and Payment.-Payment for High Intensity Light, Type B, Modified is included in the pay item **Traffic Control, Lump Sum**. No additional payment will be made.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
**SIGN TRAILER WITH SOLAR-ASSISTED FLASHERS
(TRAFFIC CONTROL, LUMP SUM)**

T&S:MWB

1 of 3

01-20-00

C&T:APPR:JKG:MLL:01-20-00

a. Description.-This special provision describes a trailer-mounted sign support with flashers, displaying a static sign and four solar-assisted LED lamps that can be turned on in an alternating flash mode, to alert the motorists of a speed reduction in the presence of workers.

This work includes furnishing, operating, inspecting, maintaining, cleaning, protecting, relocating and removing the sign trailer(s).

b. Materials.-The materials shall meet the following minimum requirements:

1. The battery storage capacity shall operate the flashing lights for a minimum period of 20 days without sun at temperatures 4 °C and above.
2. The flashing lights, amber, two each on either side of the sign panel, shall be LED type with a flash rate of 55 to 75 flashes per minute. There shall be an on-off switch for the lights.
3. The LED lamps shall be visible from 0.8 km.
4. The charger controller shall incorporate low voltage disconnect to protect the battery from complete discharge and a regulator to eliminate overcharging of the battery.
5. The charger controller shall be equipped with a photocell for 50 percent dimming for night use.
6. The sign panel stand shall accommodate 1200 mm wide warning/regulatory signs, with a minimum total panel height of 2500 mm, as shown in the typical plan A-901. The bottom height of the sign panel stand shall be not less than 800 mm.

7. A single, 175 mm diameter, flashing, amber, indicator light shall be installed on the back side of the sign panel to indicate, to the workers, that the sign trailer flashers are operational. This lamp shall be visible from a distance of 150 m.
8. The reflective sheeting for the required static signs shall be paid for by the contract items for either Sign, Type B, Temporary, Prismatic Retroreflective or Sign, Type B, Temporary as designated.
9. The trailer shall be delineated with 50mm wide strips of reflectorized red and white conspicuity tape as per the Special Provision For Reflective Conspicuity For Vehicles And Equipment In Work Zones, FUSP104(D).

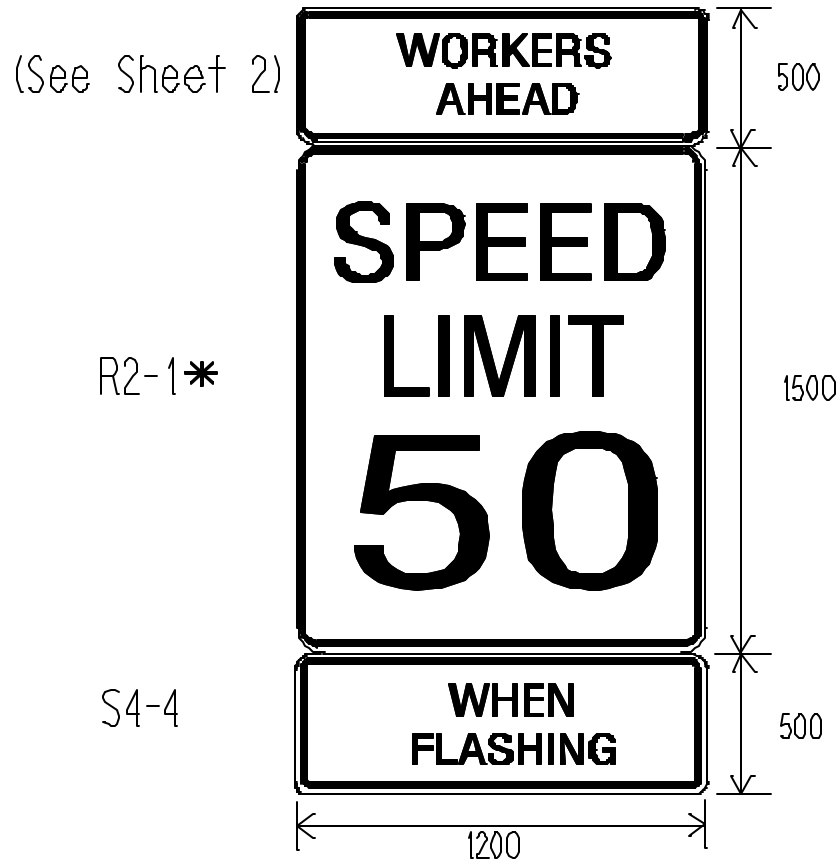
c. General Requirements.-When a lane closure, greater than or equal to 1.6 km in length, is implemented, the Sign Trailer with Solar Assisted Flashers shall be placed, within the tangent section of the lane closure, behind the channelizing devices. The trailer should be placed a minimum distance of 260 m in advance of the workers.

When lane closures less than 1.6 km in length are implemented, the Sign Trailer with Solar Assisted Flashers shall be placed 152 m in advance of the shift or taper on the shoulder.

When other configurations exist, than those described above, or if the tangent section of the lane closure, behind the channelizing devices is narrow, or none exists, the placement of the Sign Trailer with Solar Assisted Flashers shall be adjusted as outlined in the Special Provision for Maintaining Traffic.

When workers are not present, the Sign Trailer with Solar Assisted Flashers shall be turned off and relocated to a location beyond the clear zone unless the trailer has been placed behind guardrail or concrete barrier. The warning/regulatory signs on the trailer should be turned down, covered, or turned away from the approaching traffic.

d. Measurement and Payment.-Payment for Sign Trailer with Solar-Assisted Flashers is included in the pay item **Traffic Control, Lump Sum**. No additional payment will be made.



* SPEED LIMIT SHALL BE AS INDICATED IN THE SPECIAL PROVISION FOR MAINTAINING TRAFFIC.

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